NOTICE

All drawings located at the end of the document.

THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:

VOLUME I: FIELD OPERATIONS (FO)
VOLUME II: GROUNDWATER (GW)
VOLUME III: GEOTECHNICAL (GT)
VOLUME IV: SURFACE WATER (SW)
VOLUME V: ECOLOGY (EE)
VOLUME VI: AIR (AP)

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FOR VOLUME I: FIELD OPERATIONS

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	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

TITLE:
HEAVY EQUIPMENT
DECONTAMINATION

Approved By:
(Name of Approver)

MAY 12 1992
(Date)

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REVIEWED FOR CLASSIFICATION/UCNI
By
Date March 4, 1993

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2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) describes the procedures and equipment that will be used at the Rocky Flats Plant (RFP) to remove contaminants that may accumulate on heavy equipment. This SOP is applicable to all operations conducted as part of the Environmental Management (EM) Program.

This SOP describes the equipment and procedures required to complete decontamination of heavy equipment.

3.0 RESPONSIBILITIES AND QUALIFICATIONS

Radiological Engineering-approved contractor Environmental Health and Safety Specialist will perform radiation screening of all personnel and equipment leaving a work area. Screening will be performed in accordance with EG&G Radiological Operation Instruction 3.1 and screening procedures will follow Section 6.3, Contamination Monitoring of this SOP. For radiologically contaminated equipment, radiation screening will be performed following each field decontamination procedure until the equipment is free of radiological contamination or the decision is made to seal the contaminated area and transport the equipment to the central decontamination station. All radiologically contaminated heavy equipment transported to the central decontamination station will be screened by the Radiological Engineering-approved contractor Environmental Health and Safety Specialist following decontamination.

The subcontractor's project manager is responsible for ensuring that appropriate project staff and equipment are assigned to implement field decontamination, transport, and final decontamination of heavy equipment used by that subcontractor. The subcontractor's Site Safety Officer is responsible for performing Volatile Organic Compound (VOC) contamination screening of heavy equipment in accordance with the procedures given in Section 6.3, Contamination Monitoring, of

this SOP. The subcontractor's Site Safety Officer is also responsible for performing radiological monitoring during contaminant reduction of heavy equipment in the field.

All personnel operating heavy equipment or company vehicles must have appropriate training and licenses.

4.0 REFERENCES

4.1 SOURCE REFERENCES

A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001. December 1987.

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. NIOSH/OSHA/USCG/EPA. October 1985.

Nuclear Weapon Accident Response Procedures (NARP) Manual. The Defense Nuclear Agency. January 1984. Change 1, July 1984.

Radiological Operating Instruction (ROI) 3.1. EG&G.

Standard Operating Safety Guides. EPA. November 1984.

Technical Enforcement Guidance Document (TEGD). EPA. 1986.

4.2 INTERNAL REFERENCES

Related SOPs cross-referenced by this SOP are as follows:

- SOP FO.3, General Equipment Decontamination
- SOP FO.7, Handling of Decontamination Water and Wash Water
- SOP FO.8, Handling of Drilling Fluids and Cuttings
- SOP FO.10, Receiving, Labeling, and Handling Environmental Materials Containers

5.0 EQUIPMENT REQUIRED

5.1 CONTAMINATION REDUCTION IN THE FIELD

At the work site, contamination reduction will be accomplished by using the following items:

- Spatula
- Stiff bristle brushes
- Long-handled shovel
- Plastic sheeting
- Absorbent wipes
- Containers for potentially contaminated media
- A trailer and tow vehicle to transport heavy equipment from work areas known or suspected of containing surficial contamination to a central decontaminating station. Procedures to limit the spread of contamination during transport are provided in Subsection 6.4.

Contamination monitoring will be accomplished using the following instruments:

- Radiation detection equipment
- Organic Vapor Detector (OVD) (Hnu or equivalent)

5.2 MAIN DECONTAMINATION FACILITY

The most effective results will be obtained at a fixed decontamination station with provisions for ensuring that wash and rinse solutions rapidly drain away from the equipment being decontaminated and are containerized. Numerous equipment items and supplies must be furnished from various sources for the Main Decontamination Facility (MDF) to function as intended. The equipment listed below has been divided into two sections "Equipment Provided At The MDF" and "Equipment Provided By MDF Users."

Equipment And Supplies Provided At The MDF:

- Drains, pumps, and tanks for the collection and holding of decontamination and rinse solutions
- High pressure steam cleaner and high pressure wash and rinse systems
- Sufficient potable water to be used in the high pressure cleaning systems
- Portable power generator
- Splash curtains
- Wooden pallets

- A back-hoe or equivalent heavy equipment item outfitted with a "drum grappler"
- A two wheeled "dolly' designed to carry 55-gallon drums
- Overpacks to be used in the event a waste container is dropped or otherwise damaged and starts to spill wastes
- Opaque, water proof sheeting
- Plastic or nylon banding and the equipment necessary to band the sheeting to waste containers
- Long and short-handled stiff bristle brushes
- Wire brushes
- Wash and rinse buckets for equipment interiors
- Premoistened towelettes
- Duct tape or equivalent
- Windsock or equivalent method for decontamination workers to determine the wind direction

Equipment And Supplies Provided By MDF Users:

- Personal protective equipment (PPE) as required by the site-specific Health and Safety Plan.
- Waste containers for used PPE, non-reusable items required to complete decontamination, and soils dislodged during decontamination.
- An OVD to screen equipment and waste containers for an estimate of the effectiveness of decontamination efforts.
- Radiation detection equipment.
- Wash and rinse buckets necessary to establish a personal decontamination line identical to the one used at the work-site that resulted in contamination of the items being decontaminated.
- Any equipment of task-specific decontamination fluids required by a SOP or SOPA but that are not listed as being available at the MDF.
- Blank waste container labels to replace any completed labels that become dislodged or rendered unlegible during the decontamination process.
- In addition, MDF users are responsible for arranging to have a Radiological Engineering-approved contractor Health and Safety Specialist present if required.

6.0 PROCEDURES

6.1 INTRODUCTION

Each project work area will be characterized by EG&G prior to any field activity. Work area characterizations will be based on the historical background of the work area and include the chemical results of previous soil and groundwater analyses and the results of field radiological surveys conducted by a Radiological Engineering-approved contractor Environmental Health and Safety Specialist. Work areas associated with the EM program field operations fall into two characterizations: potentially contaminated and not potentially contaminated. Work areas currently characterized as potentially contaminated include the following:

- Individual Hazardous Substance Sites (IHSS's)
- Identified Groundwater Plume Areas
- Americium Zone at OU No. 2
- Protected Area (PA)

Potentially contaminated work areas where groundwater plumes have been identified will be specified in the applicable work plans, as appropriate. Table FO.4-A1 of Appendix FO.4A lists the IHSS work areas at RFP and Figure FO.10-A1 (See SOP FO.10) shows the locations of the IHSS's. Figure FO.4-1 illustrates the identified groundwater plume areas and the americium area at OU No. 2. All other potentially contaminated work areas will be specified in the individual project work plans and/or health and safety plans.

Heavy equipment used in a work area characterized as not potentially contaminated but where environmental monitoring conducted as the work progresses indicates the presence of contamination may also become contaminated. Since such contamination is not always easily discernible, it is necessary to assume that all equipment working in an area, where the presence of such substances

are known or suspected, has been contaminated. Effective decontamination procedures as described in this SOP will be implemented to minimize the potential for cross-contamination, offsite contaminant migration, and personnel exposure from improperly decontaminated equipment.

Heavy equipment used in an activity area characterized by EG&G as not potentially contaminated and where environmental monitoring conducted as the work progresses does not indicate the presence of contamination may be washed at a central decontamination station. Procedures established in Section 6.0 are not applicable, but Form FO.4A, Heavy Equipment Decontamination/ Wash Checklist and Record, Sections I, II, and III (Attachment 1), shall be completed.

For purposes of this SOP, all equipment used during drilling/boring operations that are decontaminated at the Main Decontamination Facility (MDF) (see SOP FO.12 Decontamination Facility Operations) will be classified as heavy equipment.

6.2 CONTAMINATION REDUCTION IN THE FIELD

Although the most effective decontamination will generally be accomplished at a dedicated decontamination station, it is always desirable to accomplish a reduction in overall contamination in the field prior to moving equipment to a dedicated decontamination station. The goal of contamination reduction is to limit contaminant migration from the exclusion zone. Contamination reduction will occur near the work site within the exclusion zone.

Contamination reduction is accomplished by scraping, brushing, or otherwise removing as much obvious accumulation of the potentially contaminated media as possible. After the potentially contaminated media has been removed, monitoring will be accomplished by the subcontractor's Site Safety Officer. The subcontractor's Site Safety Officer will use procedures established in EG&G Radiological Operation Instructions (ROI) 3.1, Performance of Surface Contamination Surveys, to conduct radiation monitoring during contamination reduction activities in the field. Sections 10.3 and 10.4 of the referenced ROI relate specifically to conducting monitoring of potentially contaminated heavy equipment during contamination reduction activities in the field. If monitoring indicates the presence of contamination, the contaminated areas will be wiped with heavy-duty premoistened towelettes (i.e., baby wipes) if doing so may reduce contamination. Following wipe down with the premoistened towelettes, the area will be remonitored. The preceding sequence of actions will be repeated until monitoring indicates that no further reduction in contamination is occurring. The contaminated area will then be sealed as described in Subsection 6.4. and the type, amount, and location of contamination recorded on Form FO.4A. The completed Form FO.4A will accompany the equipment and be provided to the individual responsible for completing decontamination at the main decontamination facility.

In the event disposable equipment is not available and equipment must be re-used immediately; as in the case of polybuterate liners for continuous samplers, etc., a field decontamination may be set up outside the exclusion zone. A field decontamination will including the following procedures:

- Scrape gross contamination from equipment while in the exclusion zone.
- Remove the item to be decontaminated from the exclusion zone and wash in a laboratory grade detergent and tap water. A brush may be used for residual particulates.
- Rinse the item in tap water.

- Equipment may now either be wrapped in plastic to prevent cross-contamination or be reused immediately.

Substances removed during the contamination reduction process shall be handled as described in SOP FO.7, Handling of Decontamination Water and Wash Water, SOP FO.8, Handling of Drilling Fluids and Cuttings, and SOP FO.10 Receiving, Labeling, and Handling Environmental Materials Containers.

6.2.1 Prework Activities

Limiting the amount of surfaces exposed to potential contamination is an effective method of reducing contamination. The following steps will be taken each time heavy equipment is to be used in any manner that has potential for resulting in the equipment becoming contaminated.

Once an item of heavy equipment has been taken into a potentially contaminated area, it will not normally be removed from the work area until all work that requires the presence of the equipment has been completed. Therefore care should be taken to ensure that fuel, oil, hydraulic fluid, and lubricant reservoirs are filled prior to entering the work area. For example, if "X" amount of monitoring wells are to be constructed within a given work area, then the drill rig being used will not leave the area until all drilling has been completed. Of course, augers and other like items will have to be decontaminated between bore holes. In order to reduce the potential for contamination of internal operating parts, heavy equipment will be removed from potentially contaminated areas and decontaminated if it becomes necessary to perform any maintenance on the equipment that may result in contamination of internal operating parts.

If an enclosed cab is present, it will be lined with plastic sheeting. As a minimum, the scat(s) and floor will be covered, and the sheeting secured in such a manner that it will not become dislodged during routine use.

After arriving at a work site, any compartments, tool boxes, and enclosed cabs shall be sealed by closing the doors and windows when such fixtures are present and sealing the seams around such fixtures with tape.

When at the work site, any fuel, oil, or hydraulic fluid fill ports and air cleaners will be sealed in a manner that blocks the entrance of dusts that may be radiologically contaminated unless to do so would disable a power system required to complete the field work.

6.3 CONTAMINATION MONITORING

Monitoring for potential VOC contamination and potential radiological contamination will be conducted on all heavy equipment used inside work areas characterized as potentially contaminated and on all heavy equipment used inside work areas characterized as not potentially contaminated but where environmental monitoring conducted as work progresses indicates the presence of contamination.

Radiological Engineering-approved Health and Safety Specialists will screen all equipment and personnel leaving the work area to ensure that no radioactively contaminated materials leave the work area. The Radiological Engineering-approved contractor Health and Safety Specialist will use procedures established in EG&G Radiological Operation Instruction (ROI) 3.1, Performance of Surface Contamination Surveys.

The subcontractor's health and safety representative assigned to the field team will monitor all personnel and equipment to ensure that no materials grossly contaminated with VOCs leave the area.

Special attention shall be devoted to tires, tracks, and any other surfaces that have been in direct contact with the environmental media being investigated or that have been in direct contact with other items of equipment or personnel that have been in direct contact with the environmental media being investigated. Special attention shall also be devoted to any surfaces where accumulations of the environmental media being investigated exist.

6.4 MOVEMENT OF CONTAMINATED HEAVY EQUIPMENT

A trailer will be required to move equipment to a central decontamination station if contamination monitoring indicates contamination on surfaces such as tires or tracks or any other item which may contact the ground or become dislodged when the equipment is moved. Any trailer used to move heavy equipment to a central decontamination station will be decontaminated and the effectiveness of decontamination verified in the same manner as the equipment it was used to move.

Following field contamination reduction, equipment surface areas remaining contaminated shall be covered with plastic sheeting prior to the equipment departing the exclusion zone. Edges of the sheeting will be held in place by duct tape or a similar type tape.

Contaminated heavy equipment will not be moved at speeds greater than 5 miles per hour. Heavy equipment will not be moved over paved roads during the hours of peak traffic flow, such as the beginning or end of the work day.

6.5 MAIN DECONTAMINATION FACILITY

The main decontamination facility is located adjacent to and south of the 903 Pad. Information regarding the configuration, operation, and maintenance of the central decontamination station has been prepared and may be found in SOP FO.12, Decontamination Facility Operations. The following procedures are presented in the chronological order in which they should normally occur:

6.5.1 Predecontamination Procedures

- Review Form FO.4A, Heavy Equipment Decontamination Checklist and Record to determine the level of PPE required by the applicable site-specific health and safety plan and the correct decontamination procedure.

- Establish a personnel decontamination line as described in the applicable site-specific health and safety plan.

- Personal protective equipment (PPE) will be used as required in the applicable Health and Safety Plan.

- Upon arrival at the MDF, the equipment to be decontaminated and any accompanying waste containers will be set on the ground at locations that will permit one item or group of similar items at a time to be placed within the screened-in portion of the MDF.

- If radiological monitoring during the contamination reduction process documented the suspected presence of radioactive substances that could not be removed during the contamination reduction process, arrangements will be made for a Radiological Engineering-approved contractor Health and Safety Specialist to verify the effectiveness of decontamination.

- Areas that have been sealed against exposure to the environment as required by this SOP, (due to the suspected presence of contamination that could not be removed during the contamination reduction process at the work area) will be clearly marked so that the area can be identified and monitored.

- Surfaces suspected of having tightly bound contamination that could not be removed during the contamination reduction process will be decontaminated first. Procedures specified in this SOP will be followed. The MDF user will use an OVD or radiation monitor as appropriate to screen the surfaces suspected of having had tightly bound contamination. If the screening indicates the contamination has been removed, the equipment will be moved out of the MDF and returned to service only if the type of contamination that had previously been suspected was organic contamination. If the presence of radioactive contamination was suspected, the equipment will be moved out of the MDF, parked nearby, and held out of service until verification of decontamination as described in Subsection 6.5.3, Post Decontamination Procedures, has occurred.

- Verification of effectiveness of decontamination is not required for heavy equipment surfaces that were found to be contaminant free by monitoring at the work area conducted as part of the contamination reduction process.

6.5.2 Decontamination Procedures

- Enclosed cabs

  - Remove plastic lining/covers and dispose as contaminated waste.

  - Wipe down interior surfaces.

- Use a brush to apply a detergent and water solution to the floor.

- A low-pressure water hose should be used to flush the detergent and water solution from the cab.

- Seal the cab by closing doors, windows, and vents.

• Engine compartments

- Although engines should not normally become contaminated, the engine area will be visually inspected for signs (e.g., mud splashes) of potential contamination.

- Any dry air filters servicing equipment used in a solid waste management unit will be removed and handled as radiologically contaminated waste.

- If there are not any signs of contamination, the compartment should be left as is and sealed during decontamination of exterior surfaces.

- If there appears to be contamination present, someone familiar with the engine will employ the procedures for decontaminating exterior surfaces while avoiding damage to moisture-sensitive engine components. Moisture-sensitive components may be covered with plastic during engine decontamination. The components will then be hand wiped with disposable moistened towels, following general engine decontamination.

- Following engine decontamination, the engine compartment should be sealed during decontamination of exterior surfaces.

- Exterior surfaces including trailers used to move equipment to the decontamination station

  - Inspect equipment and trailers for obvious accumulation of contaminated media that can be easily dislodged by physical means (see Subsection 6.2, Contamination Reduction in the Field).

  - Use a pressurized detergent and water solution, followed by a pressurized potable water rinse.

  - Stand upwind/crosswind of the surface being decontaminated. If necessary the equipment will be reoriented inside the decontamination station to allow an upwind or crosswind position, or hand brushing will be used to complete decontamination.

- Start at the uppermost surface and work downward including the underside of the equipment.

- Pay particular attention to areas such as tires that came into contact with a potentially contaminated media and areas that show visual signs of contamination such as mud splashes on the inside of fenders or accumulations of water in a bed.

- Move the equipment and decontaminate the equipment surfaces that have been in contact with the decontamination station floor.

- Arrange for a Radiological Engineering-approved contractor Health and Safety Specialist to conduct a smear test as described in ROI 3.1, Performance of Surface Contamination Surveys, to verify removal of radiological contamination if such contamination had been noted on the Form FO.4A when the equipment arrived. Repeat the decontamination

procedures for exterior surfaces if radiological contamination is found and then repeat the monitoring. If contamination is still present after completing the second decontamination procedure, contact the appropriate EG&G Construction Manager.

- Equipment

  - Items which come into direct contact with environmental samples collected for laboratory analysis will be decontaminated as described in SOP FO.3, General Equipment Decontamination. Examples of such items are sample containers.

  - Equipment used inside contaminated activity areas but that do not directly contact samples will be decontaminated by a pressurized detergent and water solution followed by a pressurized potable water rinse. Examples of such items include augers, drilling rods, and any hand tools used during drilling. Decontamination will be verified as described in Subsection 6.5.3, Post Decontamination Procedures.

6.5.3 Post Decontamination Procedures

- Equipment surfaces that could not be decontaminated in the field during contamination reduction activities will undergo verification of decontamination at the MDF. Verification of organic decontamination will be accomplished with an OVD by the MDF user responsible for decontaminating the equipment. Verification of radiological decontamination will be accomplished by a Radiological Engineering-approved contractor Health and Safety Specialist using the instruments and techniques specified in ROI 3.1, Performance of Surface Contamination Surveys.

- Decontaminate brushes and other reusable items of decontamination equipment as described in SOP FO.3, General Equipment Decontamination.

- Complete personal decontamination as described in the applicable site-specific health and safety plan.

- Document decontamination using Form FO.4A, Heavy Equipment Decontamination Record.

- SOP FO.7, Handling of Decontamination Water and Wash Water, provides pertinent guidance which should be followed.

7.0 DOCUMENTATION

Form FO.4A, Heavy Equipment Decontamination Record, shall be used to document information required by this SOP. Completed forms will be maintained as part of the project files. Section I of the form will be completed by the person delivering heavy equipment for decontamination. Sections III and V will be completed by the person conducting the decontamination operation.

HEAVY EQUIPMENT DECONTAMINATION/WASH CHECKLIST AND RECORD

I. General Information completed by: _____

Name Date

_____

Subcontractor's Name

Vehicle Manufacturer, Model and Common Name:_____

Equipment Owner:_____

Name and Phone Number of Person Responsible for the Equipment:_____

Serial Number/Vehicle Identification Number (VIN):_____

Delivered to Decontamination Station by:_____

Initial contaminate characterization of work area: (check one)

Not potentially contaminated_____

Potentially contaminated _____

Equipment delivered to Main Decontamination Facility on a trailer due to VOC or radiological contamination. _____ Yes _____ No

Were areas found to be contaminated covered with plastic sheeting taped in-place prior to movement? _____ Yes _____ No _____ No contamination present

II. Exposure History completed by: _____

Name Date

_____

Subcontractor's Name

Where was equipment used? _____

What was equipment used for? _____

Did verified environmental monitoring indicate the presence of contamination? ___ Yes ___ No Name of person who accomplished environmental radiological monitoring in the field

_____

Name Date Phone No. Employer's Name

Results of Radiological monitoring of equipment after final contamination reduction in the field.

_____ None detected

_____ Less than 250 cpm - Specify measured cpm ___

_____ Greater than 250 cpm - Specify measured cpm ___

If areas of measurable alpha radiation were found, clearly identify those areas by providing both a written description sufficient to enable a second party to locate the area and include a sketch of the area showing its location in relation to major components of the equipment being decontaminated.

Results of VOC monitoring after final contamination reduction in the field.

_____ VOCs at background levels
_____ VOCs greater than background

III. Actions At Main Decontamination Facility

NOTE: Sections III and V will be completed by the person conducting the decon procedure.

Yes	No	
___	___	The equipment was washed under the provisions of SOP No. FO.4, Heavy Equipment Decontamination, Subsection 6.1.
___	___	Personnel Decontamination Station established as described in the applicable site specific health and safety plan.
___	___	Personal protective equipment (PPE) selected based upon results of radiological monitoring.
___	___	Specify PPE level utilized: ___ Level B ___ Level C ___ Level D
___	___	PPE inspected prior to donning.
___	___	Wind direction checked prior to using pressurized spray (circle the direction the wind was blowing from). N NE E SE S SW W NW
___	___	Enclosed cab present and decontaminated.
___	___	Engine compartment inspected and decontaminated as required.
___	___	Were decontamination and rinse operations started at the uppermost surfaces?
___	___	Was particular attention devoted to areas such as tires that contacted a potentially contaminated medium and to areas identified as having a measurable level of alpha radiation?
___	___	Was the equipment moved to decontaminate surfaces that had been in contact with the decontamination station floor?
___	___	Was equipment used to decontaminate the heavy equipment decontaminated as described in SOP FO.3, General Equipment Decontamination?
___	___	Was personal decontamination completed as described in the applicable site-specific health and safety plan?

IV. Equipment Monitoring to Verify Removal of Contamination

Name of Radiological Engineering-approved contractor Health and Safety Specialist conducting smear test as described in ROT 3.1, Performance of Surface Contamination Surveys:

_____

Name Date

Results of smear test:_____

Name of person conducting VOC monitoring:

_____

Name Date

Results of VOC monitoring:_____

V. Follow-up Decontamination

___ Not Required
___ Required for the following area/surfaces

_____

_____

_____

Results of follow-up smear test:_____

_____ Decontamination completed
___ Decontamination incomplete and EG&G Construction Manager notified

_____

Name Date

APPENDIX FO.4A

TABLE FO.4-A1
ROCKY FLATS PLANT
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF. NO.	SITE NAME
101	207 SOLAR EVAPORATION PONDS
102	OIL SLUDGE PIT
103	CHEMICAL BURIAL
104	LIQUID DUMPING
105	OUT-OF-SERVICE FUEL TANKS
	105.1 - WESTERNMOST TANK
	105.2 - EASTERNMOST TANK
106	OUTFALL
107	HILLSIDE OIL LEAK
108	TRENCH T-1
109	TRENCH T-2
110	TRENCH T-3
	TRENCHES T-4 TO T-11
	111.1: TRENCH T-4
	111.2: TRENCH T-5
	111.3: TRENCH T-6
	111.4: TRENCH T-7
	111.5: TRENCH T-8
	111.6: TRENCH T-9
	111.7: TRENCH T-10
	111.8: TRENCH T-11
112	903 DRUM STORAGE AREA
113	MOUND AREA
114	PRESENT LANDFILL
115	ORIGINAL LANDFILL
116	MULTIPLE SOLVENT SPILLS
	116.1: WEST LOADING DOCK AREA
	116.2: SOUTH LOADING DOCK AREA

Note: This information is based on the administrative record including the information submitted in the hazardous and low-level mixed waste Part B application dated November 1, 1985, as modified by the subsequent revision dated November 28, 1986, as modified by the subsequent revision dated December 15, 1987, and the transuranic mixed waste Part B application submitted July 1, 1988, Thereafter referred to as the applications. This information is also based on independent review of historical aerial photographs of the facility and independent review of facility submittals.

TABLE FO.10-A1 (cont.)

INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF. NO.	SITE NAME
117	CHEMICAL STORAGE
	117.1: NORTH SITE
	117.2: MIDDLE SITE
	117.3: SOUTH SITE
118	MULTIPLE SOLVENT SPILLS
	118.1: WEST OF BUILDING 731
	118.2: SOUTH END OF BUILDING 776
119	MULTIPLE SOLVENT SPILLS
	119.1: WEST AREA
	119.2: EAST AREA
120	FIBERGLASSING AREAS
	120.1: NORTH OF BUILDING 664
	120.2: WEST OF BUILDING 664
121	ORIGINAL PROCESS WASTE LINES
122	UNDERGROUND CONCRETE TANK
123	VALVE VAULT 7
	123.1: VALVE VAULT 7
	4,000 GALLON TANK #67
125	HOLDING TANK
126	OUT-OF-SERVICE PROCESS WASTE TANKS
	126.1: WESTERNMOST TANK
	126.2: EASTERNMOST TANK
127	LOW-LEVEL RADIOACTIVE WASTE LEAK
128	OIL BURN PIT NO. 1
129	OIL LEAK
130	RADIOACTIVE SITE - 800 AREA SITE #1
131	RADIOACTIVE SITE - 700 AREA SITE #1
132	RADIOACTIVE SITE - 700 AREA SITE #4
133	ASH PITS
	133.1:ASH PIT 1-1
	133.2:ASH PIT 1-2
	133.3:ASH PIT 1-3
	133.4:ASH PIT 1-4
	133.5:INCINERATOR
	133.6:CONCRETE WASH PAD
134	LITHIUM METAL DESTRUCTION SITE
135	COOLING TOWER BLOWDOWN

TABLE FO.10-A1 (cont.)
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF. NO.	SITE NAME
136	COOLING TOWER PONDS
	136.1 : NORTHEAST CORNER OF BUILDING 460
	136.2 : WEST OF BUILDING 460
	136.3 : S. OF BLDG. 460, W. OF BLDG. 444
137	COOLING TOWER BLOWDOWN - BLDG. 774
138	COOLING TOWER BLOWDOWN - BLDG. 779
139	CAUSTIC/ACID SPILLS
	139.1: HYDROXIDE TANK AREA
	139.2: HYDROFLUORIC ACID TANKS
140	REACTIVE METAL DESTRUCTION SITE
141	SLUDGE DISPERSAL
142	RETENTION PONDS (A,B,C-SERIES)
	142.1: A-1 POND
	METAL DESTRUCTION SITE
141	SLUDGE DISPERSAL
142	RETENTION PONDS (A,B,C-SERIES)
	142.1: A-1 POND
	142.2: A-2 POND
	142.3: A-3 POND
	142.4: A-4 POND
	142.5: B-1 POND
	142.6: B-2 POND
	142.7: B-3 POND
	142.8: B-4 POND
	142.9: B-5 POND
	142.10: C-1 POND
	142.11: C-2 POND
	142.12 NEWLY IDENTIFIED A-5 POND
143	OLD OUTFALL
144	SEWER LINE BREAK
145	SANITARY WASTE LINE LEAK
146	CONCRETE PROCESS WASTE TANKS
	146.1: 7,500 GALLON TANK (#31)
	146.2: 7,500 GALLON TANK (#32)
	146.3: 7,500 GALLON TANK (#34W)
	146.4: 7,500 GALLON TANK (#34E)
	146.5: 3,750 GALLON TANK (#30)
	146.6: 3,750 GALLON TANK (#33)
147	PROCESS WASTE LEAKS
	147.1: MAAS AREA
	147.2: OWEN AREA
148	WASTE SPILLS
149	EFFLUENT PIPE

TABLE FO.10-A1 (cont.)
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF. NO.	SITE NAME
150	RADIOACTIVE LIQUID LEAKS (8)
	150.1: NORTH OF BUILDING 771
	150.2: WEST OF BUILDING 771
	150.3: BETWEEN BUILDINGS 771 and 774
	150.4: EAST OF BUILDING 750
	150.5: WEST OF BUILDING 707
	150.6: SOUTH OF BUILDING 779
	150.7: SOUTH OF BUILDING 776
	150.8: NORTHEAST OF BUILDING 770
151	FUEL OIL LEAK
152	FUEL OIL TANK
153	OIL BURN PIT NO. 2
154	PALLET BURN SITE
155	903 LIP AREA
156	RADIOACTIVE SOIL BURIAL
	156.1: BUILDING 334 PARKING LOT
	156.2: SOIL DUMP AREA
157	RADIOACTIVE SITE
	157.1: NORTH AREA
	157.2: SOUTH AREA
158	RADIOACTIVE SITE - BLDG. 551
159	RADIOACTIVE SITE - BLDG. 559
160	RADIOACTIVE SITE - BLDG. 444 PK LOT
161	RADIOACTIVE SITE - BLDG. 664
162	RADIOACTIVE SITE - 700 AREA SITE #2
163	RADIOACTIVE SITE - 700 AREA SITE #3
	163.1: WASH AREA
	163.2: BURIED SLAB
164	RADIOACTIVE SITE - 800 AREA SITE #2
	164.1: CONCRETE SLAB
	164.2: BUILDING 886 SPILLS
	164.3: BUILDING 889 STORAGE PAD
165	TRIANGLE AREA
166	TRENCHES
	166.1: TRENCH A
	166.2: TRENCH B
	166.3: TRENCH C
167	SPRAY FIELDS - THREE SITES
	167.1: NORTH AREA
	167.2: POND AREA
	167.3: SOUTH AREA
168	WEST SPRAY FIELD

TABLE FO.10-A1 (cont.)
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF NO.	SITE NAME
169	WASTE DRUM PEROXIDE BURIAL
170	P.U.& D. STORAGE YARD - WASTE SPILLS
171	SOLVENT BURNING GROUND
172	CENTRAL AVENUE WASTE SPILL
173	RADIOACTIVE SITE - 900 AREA
174	P.U.&D. CONTAINER STORAGE FACILITIES (2)
175	S&W BLDG. 980 CONTAINER STORAGE FACILITY
176	S&W CONTRACTOR STORAGE YARD
177	BUILDING 885 DRUM STORAGE AREA
178	BUILDING 881 DRUM STORAGE AREA
179	BUILDING 865 DRUM STORAGE AREA
180	BUILDING 883 DRUM STORAGE AREA
181	BUILDING 334 CARGO CONTAINER AREA
182	BUILDING 444/453 DRUM STORAGE AREA
183	GAS DETOXIFICATION AREA
184	BUILDING 991 STEAM CLEANING AREA
185	SOLVENT SPILL
186	VALVE VAULT 12
187	ACID LEAKS (2)
188	ACID LEAK
189	MULTIPLE ACID SPILLS
190	CAUSTIC LEAK
191	HYDROGEN PEROXIDE SPILL
192	ANTIFREEZE DISCHARGE
193	STEAM CONDENSATE LEAK
194	STEAM CONDENSATE LEAK
195	NICKEL CARBONYL DISPOSAL
196	WATER TREATMENT PLANT BACKWASH POND
197	SCRAP METAL SITES
198	VOCs IN GROUND WATER
199	CONTAMINATION OF THE LAND SURFACE
200	GREAT WESTERN RESERVOIR
201	STANDLEY RESERVOIR
202	MOWER RESERVOIR
203	INACTIVE HAZARDOUS WASTE STORAGE AREA
204	ORIGINAL URANIUM CHIP ROASTER
205	BLDG. 460 SUMP 43 ACID SIDE
206	INACTIVE D-836 HAZARDOUS WASTE TANK
207	INACTIVE 444 ACID DUMPSTER
208	INACTIVE 444/447 WASTE STORAGE AREA
209	SURFACE DISTURBANCE SOUTHEAST OF BLDG. 881
210	UNIT 16, BUILDING 980 CARGO CONTAINER

TABLE FO.10-A1 (cont.)
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

REF NO.	SITE NAME
211	UNIT 26, BUILDING 881 DRUM STORAGE
212	UNIT 63, BUILDING 371 DRUM STORAGE
213	UNIT 15, 904 PAD PONDCRETE STORAGE
214	UNIT 25, 750 PAD PONDCRETE AND SALTCRETE STORAGE
215	UNITS 55.13, 55.14, 55.15, 55.16 -
	TANKS T-40, T-66, T-67, T-68
216	EAST SPRAY FIELDS
	216.1: NORTH AREA
	216.2: CENTER AREA
	216.3: SOUTH AREA
217	UNIT 32, BUILDING 881, CN- BENCH SCALE TREATMENT

750,000 + 2,084,000

OPERABLE UNIT NO. 2 BOUNDARY

EAST TRENCHES AREA

MOUND AREA

903 PAD AREA

AREA OF POTENTIAL CONTAMINATION IN OU2 CONTAINING IHSSs, VOLATILE ORGANIC PLUMES IN ALLUVIAL GROUNDWATER, AND THE AMERICIUM ZONE

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

FIGURE FO.4-1

OPERABLE UNIT NO. 2

POTENTIALLY CONTAMINATED WORK AREAS IN OPERABLE UNIT NO. 2

N

0' 200' 400'
SCALE 1"=400'

November 1990